

## Federal Electronics

	(millions of dollars)	1970	1971	1972	1975
<b>FEDERAL ELECTRONICS, TOTAL</b>	11,771	11,174	11,644	13,401	
Defense Department, total	10,217	9,752	10,149	11,531	
Procurement, total	5,754	5,007	5,307	6,463	
Communications and intelligence	1,170	887	993	1,411	
Aircraft and related ground equipment	1,656	1,303	1,156	1,567	
Missiles and space systems	2,075	2,027	2,271	2,440	
Mobile and ordnance	346	297	284	342	
Ships and conversions	507	493	603	703	
Research and development, test and engineering	2,329	2,592	2,672	2,835	
Operations and maintenance	2,134	2,153	2,170	2,233	
NASA	1,160	985	998	1,116	
Transportation Department, total	126	148	188	297	
FAA	110	125	147	236	
Highway and transit systems	16	23	41	61	
Health, Education and Welfare Department, total	268	289	309	457	
Education systems	120	129	135	164	
Health care electronics	148	160	174	293	

## U.S. Markets Forecast

Market estimates represent U.S. factory sales and are based on an Electronics survey. In certain cases, product categories have been added, deleted, or redefined; these market totals are not directly comparable to those of previous years.

## Consumer Electronics

	(millions of dollars)	1970	1971	1972	1975
<b>CONSUMER ELECTRONICS, TOTAL*</b>	3,529.3	3,885.1	4,094.0	4,751	
Television receivers, total	2,178.0	2,440.0	2,585.0	2,940	
Color	1,660.0	1,940.0	2,100.0	2,500	
Monochrome	518.0	500.0	485.0	440	
Audio equipment, total	1,144.3	1,207.4	1,242.1	1,283	
Radios, total	395.0	439.7	446.3	462	
Table, clock and portable (AM and FM)	124.0	129.7	136.8	152	
Automobile (AM and FM)	271.0	310.0	309.5	310	
Phonos and radio-phonos	334.0	341.0	347.0	350	
Tape recorders and players, total	280.3	282.7	295.8	306	
Auto cassette and cartridge	135.0	135.0	140.0	155	
Cassette and cartridge player/recorders	77.9	86.4	100.0	108	
Reel-to-reel recorders	67.4	61.3	55.8	43	
Hi-fi components (amplifiers, receivers, tuners, speakers, etc.)	135.0	144.0	153.0	165	
Other consumer products, total	195.7	222.2	240.3	298	
Musical instruments, including organs and amplifiers	141.0	162.0	175.0	210	
Kits	54.7	60.2	65.3	88	
Automotive electronics, non-entertainment, total	11.3	15.5	26.6	230	

\*Includes domestic manufactured and domestic-label imports, but does not include foreign-label imports

## COMPONENTS

	(millions of dollars)	1970	1971	1972	1975
<b>COMPONENTS, TOTAL</b>	5,338.1	5,334.6	5,639.5	6,490	
Antennas and antenna hardware, total	423.8	388.0	423.0	493	
Capacitors, total	449.3	438.7	460.2	523	
Paper	67.8	64.9	63.6	62	
Film	83.8	85.1	91.2	108	
Electrolytic	180.3	166.2	178.2	212	
Aluminum	81.5	78.8	83.1	95	
Tantalum	98.8	87.4	95.1	117	
Mica	19.9	21.8	21.4	17	
Glass and vitreous	8.9	7.6	7.0	6	
Ceramic	68.8	72.1	75.3	86	
Variable	11.7	11.4	11.8	13	
Chip	8.1	9.6	11.7	19	
Connectors, total	288.4	286.2	311.7	381	
Standard coaxial	29.5	29.0	31.0	36	
Miniature coaxial	11.0	11.0	13.0	18	
Cylindrical	93.0	85.9	90.3	111	
Rack and panel	73.6	78.5	87.5	105	
Special-purpose and fused	8.9	8.9	8.9	10	
Printed circuit, total	65.0	70.0	78.0	98	
Card insertion	41.2	43.5	46.0	58	
Two-piece, metal-to-metal	13.7	14.1	16.1	21	
Plate module	10.1	12.4	15.9	19	
Dual in-line sockets	3.4	2.9	3.0	3	
Electron tubes, total	999.2	1,045.7	1,055.8	1,060	
Receiving	207.0	195.5	178.5	141	
Power and special-purpose, total	317.0	320.1	331.9	344	
High-vacuum	57.3	54.0	52.7	50	
Gas and vapor	15.5	14.7	14.5	13	
Klystrons	34.7	33.8	33.1	32	
Magnetrone	36.8	34.5	34.3	33	
TWT's and backward wave	70.1	68.3	68.1	65	
Light sensing	39.2	41.3	44.0	49	
Image-sensing (including TV cameras and image intensifiers)	20.6	24.8	29.5	33	
Storage	15.2	15.1	15.9	17	
Silicon-diode array	3.1	3.2	3.2	8	
Display, except CRT	10.1	14.2	19.5	23	
Cathode-ray, except TV	14.4	16.2	17.1	21	
TV picture, color	408.0	464.3	490.0	540	
TV picture, monochrome	67.2	65.8	55.4	35	
Filters, networks and delay lines, total	156.9	158.8	164.4	187	
Delay lines	16.1	16.5	14.9	14	
Passive LC	31.3	30.0	30.4	31	
RC networks	40.5	38.9	41.7	50	
Crystal filters	26.7	28.6	31.1	33	
RFI and EMI filters	38.5	36.9	36.8	40	
Active filters	3.8	7.9	9.5	19	
Magnetic components, total	255.3	271.3	285.4	298	
Computer memory cores	24.9	31.8	41.3	40	
Transformers and chokes, except TV	174.0	176.1	179.4	188	
Laminated	99.5	108.1	112.3	116	
Toroidal	41.1	36.2	36.5	42	
Pulse	33.4	31.8	30.6	30	
TV magnetic, including yokes and flybacks	40.8	48.3	49.5	54	
RF coils	15.6	15.1	15.2	16	

	(millions of dollars)	1970	1971	1972	1975
<b>Microwave components and hardware, total</b>	78.9	79.6	84.6	94	
Mixers	10.1	10.1	10.6	12	
Detectors	3.5	3.5	4.1	5	
Passive components (filters, couplers, terminations, attenuators, etc.), total	30.3	31.8	33.5	36	
Waveguide type	8.2	8.4	8.6	9	
Coaxial and stripline	22.1	23.4	24.9	27	
Switches, total	10.4	10.6	11.7	14	
Waveguide type	3.2	3.3	3.6	4	
Coaxial and stripline	7.2	7.3	8.1	10	
Ferrite devices, total	20.5	19.6	20.5	22	
Isolators	4.1	4.4	4.8	5	
Circulators	12.1	10.8	11.1	12	
YIG devices	4.3	4.4	4.6	5	
Power limiters	4.1	4.0	4.2	5	
<b>Printed circuit boards, total</b>	136.4	128.8	136.1	173	
Single-layer	21.1	19.9	15.2	10	
Two-layer	84.5	79.1	86.7	115	
Multilayer	24.7	24.6	28.9	39	
Flexible	6.1	5.2	5.3	9	
<b>Quartz crystals (including mounts and ovens), total</b>	45.3	45.2	48.6	56	
<b>Relays, total</b>	239.6	246.5	262.8	302	
Solid state	15.5	16.7	18.9	26	
Electromagnetic, total	99.0	104.6	113.8	136	
Contact meter	4.9	5.1	5.4	6	
Crystal can	26.1	27.0	29.2	34	
Dry reed	20.7	22.6	26.5	35	
Mercury wetted	14.4	15.5	16.7	20	
Resonant reed	1.4	1.9	2.3	4	
Telephone	27.5	28			

## Industrial and Commercial Markets

(millions of dollars) 1970 1971 1972 1975

INDUSTRIAL AND COMMERCIAL, TOTAL				
	1970	1971	1972	1975
Test and measuring instruments, total	722.5	715.1	758.6	914
Spectrum analyzers (<1 GHz)	13.9	14.2	15.1	20
Frequency synthesizers	14.1	15.2	17.5	25
Function generators	7.0	7.2	7.6	10
Signal generators	23.8	24.3	25.8	28
Sweep generators (<1 GHz)	10.3	10.8	11.7	15
Pulse generators (<1 GHz)	9.9	9.4	10.6	13
Oscillators (<1 GHz)	17.0	16.7	17.7	21
Waveform analyzers and distortion meters	14.0	13.0	14.0	18
Counters, time and frequency	31.7	28.8	30.8	39
Timers, electronic	81.0	82.0	83.0	85
Panel meters, total	32.5	32.0	31.0	36
Analog	23.0	22.0	20.0	19
Digital	9.5	10.0	11.0	17
Frequency measuring (except counters)	11.1	12.4	13.9	16
Analog voltmeters, ammeters and multimeters (<1 GHz)	10.1	9.4	8.5	6
Digital voltmeters, total	37.9	36.3	38.3	42
3½ digit	10.1	10.4	11.4	13
4½ digit and above	27.8	25.9	26.9	29
Automatic bridges	3.6	3.7	4.0	5
Manual bridges	4.0	4.2	4.3	5
Calibrators and standards	5.6	5.8	6.0	7
Oscilloscopes, total	142.6	145.1	157.4	207
Non-plug-in	73.6	74.8	80.3	102
Plug-in (mainframe)	57.1	56.8	59.5	80
Accessories and plug-ins	11.9	13.5	17.6	25
Recording instruments, total	95.5	92.3	98.6	114
Magnetic tape	42.6	40.9	42.8	52
Strip chart	44.1	43.7	47.2	52
X-Y	8.8	7.7	8.6	10
Component testers	49.7	51.2	59.4	79
Power supplies, lab and industrial	107.2	101.1	103.4	123
Microwave measuring equipment, total	87.1	87.1	95.7	117
Phase measuring	8.3	9.1	10.5	13
Impedance measuring	14.1	14.3	15.7	19
Power measuring	4.4	4.6	4.9	7
Spectrum analyzers	12.4	13.2	14.1	19
Frequency measuring	5.1	5.4	6.2	7
Noise measuring	1.8	1.9	1.9	2
Signal generators	13.2	12.5	13.7	16
Sweep generators	15.1	14.3	16.2	20
Field intensity meters and test receivers	6.9	6.8	7.0	8
Antenna pattern measuring	5.8	5.0	5.5	6

Medical equipment, total				
	1970	1971	1972	1975
Diagnostic equipment, total	529.9	579.7	639.3	832
X-ray (including intensifiers)	399.6	431.5	470.6	577
Electrocardiographs	146.0	152.0	160.0	210
Electroencephalographs	13.5	15.2	18.8	25
Ultrasonic scanners	6.1	6.4	6.7	8
Nuclear equipment	2.5	2.8	3.2	5
Other (lab instrumentation)	26.0	29.9	34.1	39
Electron microscopes	195.0	214.0	235.0	275
Patient monitoring systems, total	10.5	11.2	12.8	15
Cardiac systems	28.7	34.2	39.4	80
Respiratory systems	2.1	2.5	2.8	55
Telemetry for monitoring	1.0	2.7	4.0	11
Transducers for monitoring	2.5	2.7	3.0	8
Therapeutic equipment, total	3.1	3.5	4.3	6
X-ray	13.9	15.2	16.7	21
Ultrasonic	5.1	5.9	7.0	9
Diathermy	4.7	5.1	5.4	7
Defibrillators	4.6	4.9	5.9	9
Prosthetic equipment, total	73.3	82.9	94.3	129
Hearing aids	41.4	46.5	50.8	61
Pacemakers	22.9	25.5	31.1	48
Organ support systems	8.5	10.4	11.9	16
Motorized limbs	0.5	0.5	0.5	4

(millions of dollars)				
	1970	1971	1972	1975
Computers and related equipment, total	5,971.3	6,012.0	7,396.9	10,771
General purpose digital systems, total	4,174.0	4,172.0	5,080.0	6,770
Mini (<\$50,000)	250.0	280.0	365.0	860
Small (\$50,000 - \$200,000)	495.0	510.0	565.0	780
Medium (\$200,000 - \$750,000)	1,114.0	1,102.0	1,310.0	1,500
Large (\$750,000 - \$1,500,000)	1,435.0	1,390.0	1,650.0	1,950
Giant (>\$1,500,000)	880.0	890.0	1,190.0	1,680
Analog and hybrid systems	53.5	50.3	51.7	55
Calculators	119.2	131.1	218.2	491
Standard (desk)	51.2	52.5	61.0	111
Programmable	60.1	69.5	108.0	210
Portable (personal)	7.9	10.1	49.2	170
Peripheral equipment, total	1,624.6	1,657.6	2,047.0	3,455
Data entry devices, total	420.0	428.5	467.0	593
Keypunch (key-to-card)	80.5	78.5	76.5	52
Key-to-tape	120.8	105.4	107.1	115
Key-to-disk	22.7	36.8	48.4	78
(including shared-processor systems)	56.0	70.6	92.0	210
Optical character recognition	8.5	14.5	56.8	215
Source data collection terminals, total	4.4	9.8	51.5	195
Point-of-sale	4.1	4.7	5.3	20
Other	975.8	984.4	1,223.1	2,259
Data storage devices, total	10.5	19.4	35.0	74
Digital cassette transports	290.0	376.5	450.0	440
Reel-to-reel tape transports	619.4	530.0	665.0	1,150
Disk drives	25.4	22.5	28.1	40
Drum	30.5	36.0	45.0	115
Secondary (core and semiconductor)	125.6	125.5	159.5	225
Output equipment, total	35.5	33.0	40.0	50
Impact line printers	12.5	17.0	28.0	35
Non-impact printers	58.5	50.7	64.0	90
Plotters	19.1	24.8	27.5	50
Computer-output-to-microfilm	234.7	241.9	277.6	301
Data terminals, total	190.0	186.5	211.0	200
Teletypewriters	44.7	55.4	66.6	101
CRT				

(millions of dollars)				
	1970	1971	1972	1975
Communications equipment, total	1,723.4	1,719.9	1,933.5	2,516
Radio, total	565.4	552.9	633.6	748
Airborne, including ground lines	127.3	111.1	113.0	120
Land mobile	290.5	295.8	314.4	354
Marine	17.0	18.6	20.1	24
Microwave relay	109.7	106.5	165.0	228
Amateur	11.1	11.0	11.2	12
Citizens band	9.8	9.9	9.9	10
Navigation, (radar, loran, VOR, etc.)	149.3	128.0	131.0	150
Terminal and switching	158.0	170.4	197.3	315
Intercoms	180.5	195.7	218.5	260
Commercial sound and p.a.	252.0	243.9	252.1	265
A-M and F M station equipment	17.5	18.0	19.2	21
TV station equipment	149.8	142.1	150.3	190
Facsimile	34.4	39.9	54.9	101
Telemetry	36.1	35.0	51.4	65
Modems	38.3	45.8	57.4	150
Multiplexers	27.5	27.3	30.5	49
Satellite ground stations	10.0	10.0	10.0	35
Paging systems	17.1	18.8	20.4	22
Non-broadcast TV equipment, total	87.5	92.1	106.9	145
CATV equipment, total	58.0	58.8	64.9	94
Studio equipment (program origination)	8.7	9.1	10.2	12
Head-end equipment (including transmitters, receivers, amplifiers, etc.)	5.8	5.8	5.1	7
Distribution equipment (including amplifiers, power supplies, couplers, transformers)	20.8	21.0	22.7	35
Transmission lines and fittings	21.1	21.2	23.4	30
Converters	1.6	1.7	3.5	10
CCTV equipment, total	24.0	23.2	26.8</td	